



ClareVision Network Video Recorder Installation Guide

4-Channel NVR with PoE



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Version	This document applies to CV-B4410-01 ClareVision Network Video Recorder Installation Guide Revision 01.
Contact information	For contact information, see www.clarecontrols.com .

Note: The figures shown in this manual are for reference only. The appearance and interface of the device are subject to the actual model.

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NVR pre-installation

This NVR is highly advanced surveillance equipment that should be installed with care. Follow these precautionary steps before the installation of the NVR.

- Keep all liquids away from the NVR.
- Install the NVR in a well-ventilated and dust-free area.
- Ensure environmental conditions meet factory specifications.
- Install a manufacturer recommended HDD.

Package contents

- 1 X 4 channel NVR appliance
- 1 X AC power cord
- 1 X optical mouse
- 1 X remote Control
- 1 X SATA hard drive cable
- 4 X small Phillips head screws
- 1 X technical bulletin: NVR Understanding Camera Capacity

NVR installation

When installing the NVR:

- Ensure there is ample room for the audio and video cables.
- When routing cables, ensure that the bend radius of the cables is no less than five times the diameter.
- Connect both the alarm and RS-485 cable.
- Ensure the NVR is grounded.
- Environmental temperature should be within the range of 14°F to 131°F (-10 °C to 55 °C).
- Environmental humidity should be within the range of 10% to 90%.

Hard disk installation (optional)

Additional SATA hard disks can be installed on your NVR. Disconnect the power from the NVR before installing a hard disk drive (HDD). A factory recommended HDD should be used for this installation.

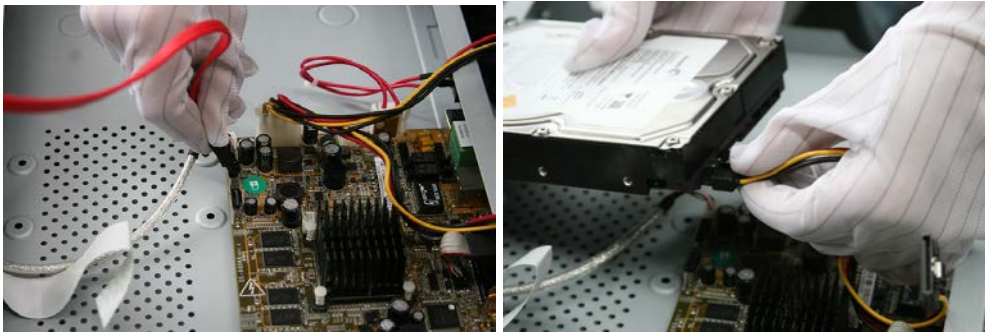
Tools required: screwdriver.

To install the hard disk drive into the NVR:

1. Remove the cover from the NVR by unfastening the screws on the rear and side panels.



2. Connect one end of the data cable to the motherboard of the NVR and the other end to the HDD.



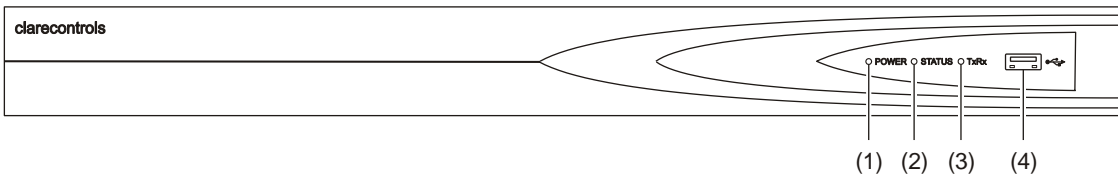
3. Connect the power cable to the HDD.



4. Place the HDD on the bottom of the device, and then fasten the screws on the bottom to affix the HDD.

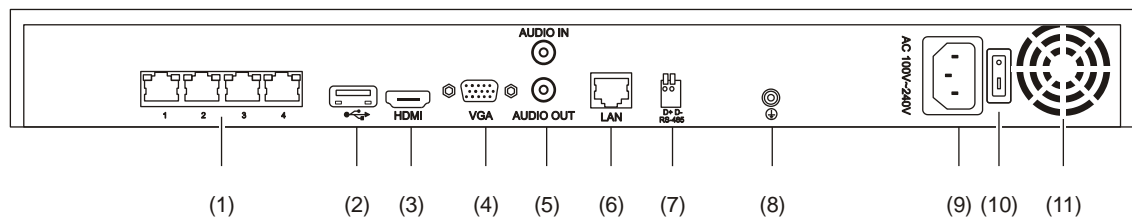


Front panel



No.	Name	Description
1	Power	POWER: The POWER LED turns green when the NVR is powered up.
2	Status	<p>READY: The LED is green when the device is running normally.</p> <p>STATUS:</p> <ol style="list-style-type: none"> 1. The light is green when the IR remote control is enabled. 2. The light is red when the function of the composite keys (SHIFT) are used. 3. The light will not be on if one of the above conditions are not met. <p>ALARM: When an alarm occurs, the light will turn red.</p> <p>HDD: The LED flashes red when the HDD is reading/writing.</p>
3	Tx/Rx	Tx/Rx LED flashes green when the network connection is functioning normally.
4	USB	USB connector.

Rear panel



No.	Item	Description
1	Network Interfaces with PoE function	The network interfaces for the cameras and provide power over Ethernet.
2	USB	Connects USB disks and devices.
3	HDMI	HDMI video output connector.
4	VGA	DB9 connector for VGA output. Display local video output and menu.
5	AUDIO IN AUDIO OUT	BNC connector for audio input. (Also for two-way audio) BNC connector for audio output.
6	LAN Interface	1 network interface.
7	RS-485 Interface	Connector for RS-485 devices. T+ and T- pins connect to R+ and R- pins of PTZ receiver respectively.
8	Ground	Ground (needs to be connected when NVR starts up).
9	Power Supply	12 VDC power supply.
10	Power Switch	Switch for turning on/off the device.
11	Fan	Removes heat from the device.

HDD storage calculation chart

The following chart shows an estimate of storage space used based on recording on one channel for an hour at a fixed bit rate.

Table 1: Storage calculation chart

Bitrate	Storage used
96 K	42 M
128 K	56 M
160 K	70 M
192 K	84 M
224 K	98 M
256 K	112 M
320 K	140 M
384 K	168 M
448 K	196 M
512 K	225 M
640 K	281 M
768 K	337 M
896 K	393 M
1024 K	450 M
1280 K	562 M
1536 K	675 M
1792 K	787 M
2048 K	900 M
4096 K	1800 M
8192 K	3600 M
1638 4K	7200 M

Note: The values supplied for the storage space used are only for reference. The storage values in the chart are estimated by formulas and may be different from the actual value.

Startup

Proper startup procedures are crucial to expand the life of the NVR.

To start the NVR:

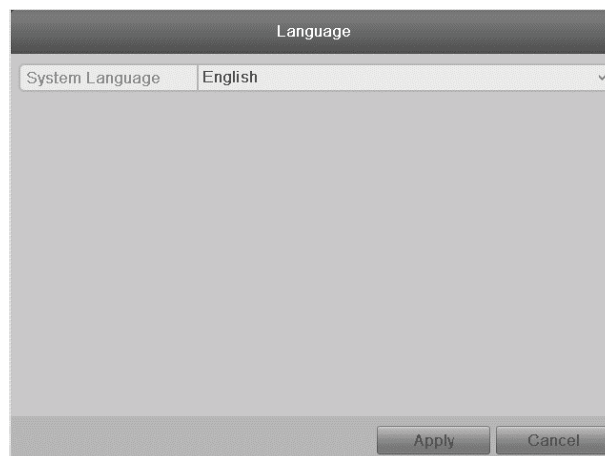
1. Check that the power supply is plugged in. We recommend that you use an Uninterruptible Power Supply (UPS) in conjunction with the device.
2. Press the POWER button on the rear panel. The Power LED should turn green as the unit starts.

Using the Setup Wizard

By default, the Setup Wizard starts once the NVR has loaded.

To operate the Setup Wizard:

1. Select the system language from the drop-down menu, and then click **Apply** to save the resolution settings. The default language is English.



2. The Setup Wizard can walk you through settings of the NVR. If you do not want to use the Setup Wizard, click **Cancel**. You can use the Setup Wizard the next time by selecting the **Start wizard when NVR starts?** checkbox.



3. Click **Next** on the Wizard window to enter the Login window.

The screenshot shows a window titled "Wizard". It contains four input fields: "Admin Password" (masked with asterisks), "New Admin Password" (with a checked checkbox), "New Password" (masked with asterisks), and "Confirm" (masked with asterisks). To the right of the "Confirm" field is a small icon of a key. At the bottom of the window, there are three buttons: "Previous", "Next", and "Cancel".

4. Enter the admin password. By default, the password is "secure7"
5. To change the admin password, select the **New Admin Password** checkbox. Enter and confirm the new password in the given fields.
6. Click **Next** to enter the date and time settings window.

The screenshot shows a window titled "Wizard". It contains a table with the following data:

Time Zone	{GMT+00:00} Dublin, Edinburgh, London	▼
Date Format	DD-MM-YYYY	▼
System Date	20-03-2013	📅
System Time	14:55:31	🕒

At the bottom of the window, there are three buttons: "Previous", "Next", and "Cancel".

7. After the time settings are set, click **Next** to return to the Network Setup Wizard window.

The screenshot shows a 'Wizard' window for network configuration. It contains several input fields and buttons. The 'NIC Type' is set to '10M/100M/1000M Self-adaptive'. 'Enable DHCP' is unchecked. The 'IPv4 Address' is '172.6.13.111', the 'IPv4 Subnet Mask' is '255.255.255.0', and the 'IPv4 Default Gateway' is '172.6.13.1'. There are empty fields for 'Preferred DNS Serv...' and 'Alternate DNS Server'. The 'Internal NIC IPv4 Ad...' is '192.168.1.1'. At the bottom are 'Previous', 'Next', and 'Cancel' buttons.

Field	Value
NIC Type	10M/100M/1000M Self-adaptive
Enable DHCP	<input type="checkbox"/>
IPv4 Address	172.6.13.111
IPv4 Subnet Mask	255.255.255.0
IPv4 Default Gateway	172.6.13.1
Preferred DNS Serv...	
Alternate DNS Server	
Internal NIC IPv4 Ad...	192.168.1.1

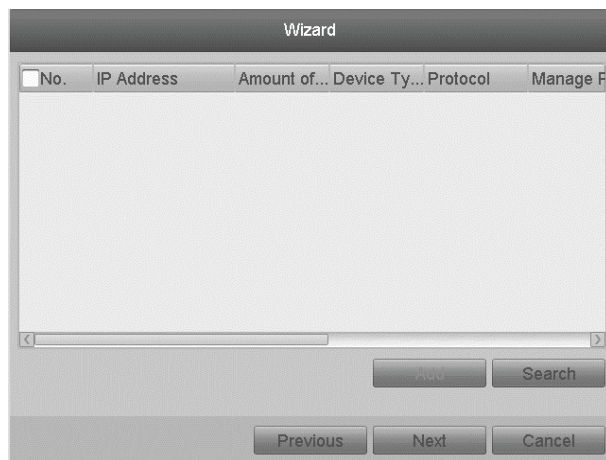
Note: The internal NIC IPv4 address must be on a separate subnet.

8. Click **Next** to enter the HDD Management window.

The screenshot shows an 'HDD Management' window. It features a table with columns: 'Capacity', 'Status', 'Property', 'Type', and 'Free Space'. The first row is selected with a checkmark and contains the values: '1', '465.76GB', 'Normal', 'R/W', 'Local', and '465GB'. Below the table is an 'Init' button. At the bottom are 'Previous', 'Next', and 'Cancel' buttons.

	Capacity	Status	Property	Type	Free Space	
<input checked="" type="checkbox"/>	1	465.76GB	Normal	R/W	Local	465GB

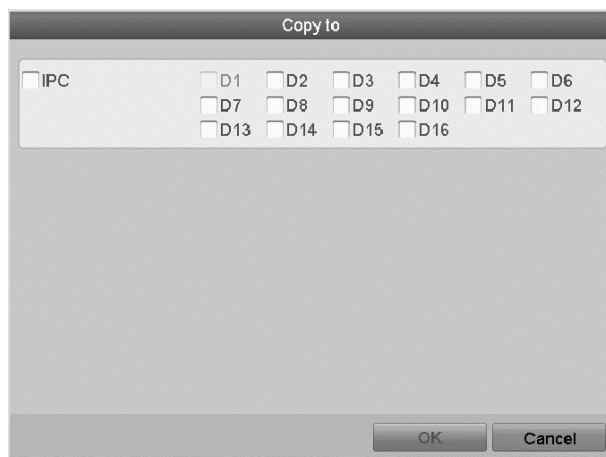
9. To initialize the HDD, click **Init.**, initialization removes all the data saved in the HDD.
10. Click **Next**. You will enter the Adding IP Camera interface.
11. Click **Search** to find the online IP Camera.
12. Select the IP camera, and then click **Add**.



13. Click the **Next** button. Configure the recording for the searched IP Cameras.



14. Click **Copy** to copy the settings to other channels.






15. Click **OK** to complete the Setup Wizard.

Live View

Some icons are provided on screen in Live View mode to indicate the different camera statuses. Icons appear at the top right of the screen for each channel. They show the status of the record and alarm features in the channel so that you can identify problems quickly.

Table 2: Live View icons

Icon	Description
	Alarm (video loss, tampering, motion detection, or sensor alarm)
	Record (manual record, schedule record, motion detection, or alarm triggered record)
	Alarm and Record

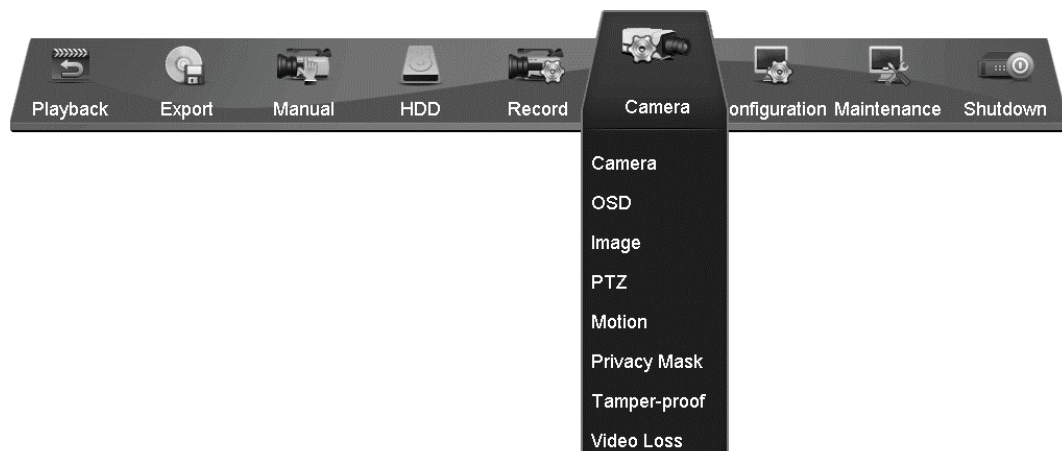
Adding and configuring IP cameras

Add and configure the online IP cameras to enable the live view and recording functions.

You can search and add the online IP cameras by using the Startup Wizard, or by following these steps.

To add IP cameras:

1. Enter the Camera Management interface (Menu > Camera > Camera).



To add the online cameras with same network segment:

1. Click **Search** to search the online cameras.

IP Camera No.	IP Camera 5	No.	Edit	IP Address	Amount of C...	Device
IP Camera Ad...	172.6.21.65	<input checked="" type="checkbox"/> 1		172.6.21.65	1	IPC
Protocol	ONVIF					
Management ...	80					
User Name	admin					
Admin Passw...						

Camera...	Edit	Delete	Live ...	Camera Name	IP Camera Addr...	Manage Port	Protocol	Device M...	Status
D1				IPCamera 01	172.6.21.64	8000			Discon
D2				854	172.6.21.221	8000		DS-2CD8...	Conne.
D3				IPCamera 03	172.6.23.85	8000			Discon
D4				Camera 01	172.6.23.123	8000		DS-2CD8...	Conne.

Net Receive Idle Bandwidth: 71Mbps

2. Select the checkboxes for the cameras to be added.
3. Click **Quick Add** to add the cameras.

Configuring basic parameters of IP cameras

After adding the IP camera, the camera information displays on the page. Configure the basic parameters of the IP camera.

To configure or edit IP cameras:

1. Click the icon to edit the parameters. You can edit the IP address, protocol, and other parameters seen in the box below.

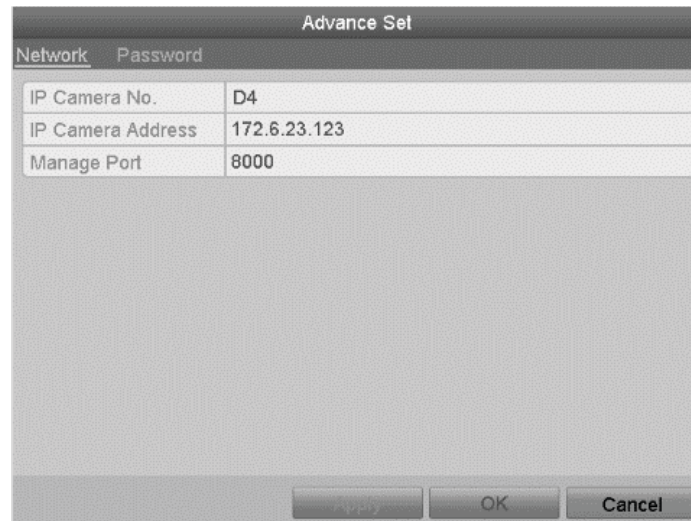
Edit IP Camera	
IP Camera No.	D2
IP Camera Address	172.6.21.221
Protocol	ONVIF
Manage Port	80
Channel No.	1
User Name	admin
Admin Password	

Apply OK Cancel

2. Click **Apply** to save the settings, and then click **OK** to exit the editing interface.

More parameter options:

1. Scroll to the right on the screen, and then click the **Advance Set** icon.






Advance Set	
Network Password	
IP Camera No.	D4
IP Camera Address	172.6.23.123
Manage Port	8000

Apply OK Cancel

2. You can edit the network information and the password of the camera.
3. Click **Apply** to save the settings, and then click **OK** to exit the interface.

Table 3: Basic icons

Icon	Description
	Edit basic parameters of the camera
	Delete the IP camera
	Get the live view of the camera

PTZ control

Follow the procedure to set the parameters for the PTZ. You should configure the PTZ parameters before you set the PTZ of the camera. Before you begin, ensure the PTZ and the NVR are connected properly through the RS-485 interface.

PTZ settings

To set PTZ:


1. Enter the PTZ Settings interface (**Menu > Camera > PTZ**).

General		More Settings	
Camera	IP Camera 2		
Baud Rate	9600		
Data Bit	8		
Stop Bit	1		
Parity	None		
Flow Ctrl	None		
PTZ Protocol			
Address	0		

Address range: 0~255

2. Choose the camera for PTZ setting next to the Camera label.
3. Enter the parameters for the PTZ camera.
Note: All the parameters should be the same as the PTZ camera parameters.
4. Click **Copy** to copy the settings from other PTZ cameras.
5. Click **Apply** to save and exit the interface.

PTZ control

To enter the PTZ panel in the Live View mode, you can press the PTZ Control button on the front panel, on the remote, or choose the PTZ Control icon .

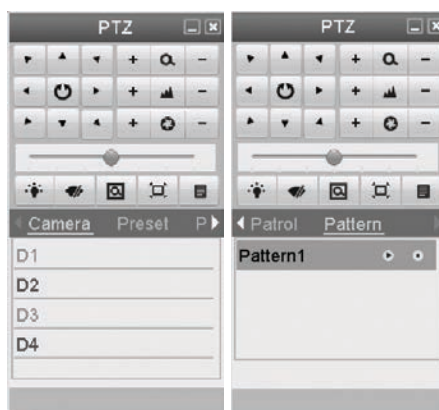


















Table 4: PZT control icons

Icon	Description
	Direction button and the auto-cycle button
	The speed of the PTZ movement
	3D-Zoom
Patrol	Patrol
	Previous item
	Stop the patrol or pattern movement
	Zoom+, Focus+, Iris+
	Light on/off
	Image Centralization
Pattern	Pattern
	Next item
	Minimize windows
	Zoom-, Focus-, Iris-
	Wiper on/off
Preset	Preset
	Menu
	Start pattern/patrol
	Exit

Playback

Play back the recorded files of a specific channel in the Live View menu.

Instant playback by channel

Choose a channel under Live View using the mouse, and then click the  button in the shortcut operation menu.

Note: Only files recorded during the last five minutes on the channel will be played back.



Playback by channel

To playback by channel:

1. Enter the Playback menu.

Mouse: Right-click a channel in Live View mode and select  from the menu.



Front Panel: Press PLAY to play record files for the channel under a single-screen live view.

Under multi-screen live view, record files of the selected channel will be played back.

Note: Pressing numeric buttons will switch playback to the related channels during the playback process.

Playback management

The toolbar at the bottom of the Playback interface can be used to control the playback process.



Check the channel or channels if you want to switch playback to another channel or execute simultaneous playback of multiple channels.

Backup

Recorded files can be backed up to various devices, such as USB flash drives, USB HDDs, or a DVD writer.

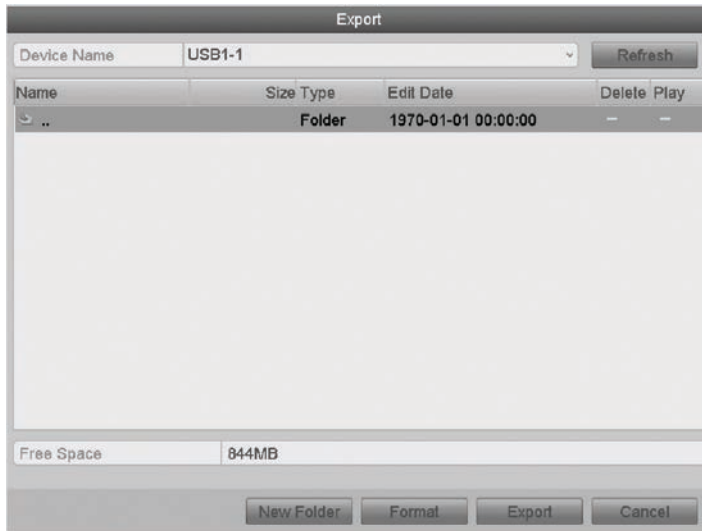
To back up recorded files:


1. Enter Video Export interface (**Menu > Export > Normal**).
2. Select the channels you want to back up, set search condition, and then click **Search** to enter the search result interface.

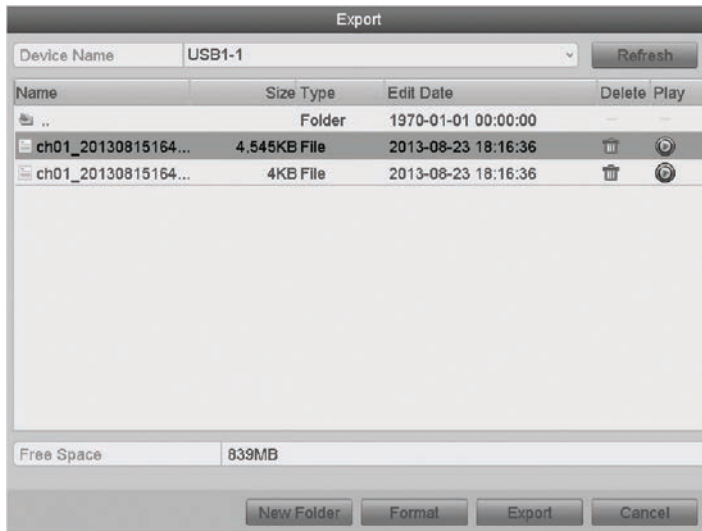
Normal	
<input checked="" type="checkbox"/> IPC	<input checked="" type="checkbox"/> D1 <input checked="" type="checkbox"/> D2 <input checked="" type="checkbox"/> D3 <input checked="" type="checkbox"/> D4 <input checked="" type="checkbox"/> D5 <input checked="" type="checkbox"/> D6 <input checked="" type="checkbox"/> D7 <input checked="" type="checkbox"/> D8 <input checked="" type="checkbox"/> D9 <input checked="" type="checkbox"/> D10 <input checked="" type="checkbox"/> D11 <input checked="" type="checkbox"/> D12 <input checked="" type="checkbox"/> D13 <input checked="" type="checkbox"/> D14 <input checked="" type="checkbox"/> D15 <input checked="" type="checkbox"/> D16
Start/End time of record	2013-07-09 15:02:22 -- 2013-08-23 16:45:03
Record Type	All
File Type	All
Start Time	2013-08-23 00:00:00
End Time	2013-08-23 23:59:59

3. In the Search result interface, select the record files you want to back up and click **Export**.
4. Enter the Export interface, choose a backup device, and then click **Export** to start exporting.

Note: You can choose to export the record files and the related log files to the player.



5. Check the backup results. Choose the record file in the Export interface, and then press  to check it.



Understanding camera capacity in an NVR

When setting up your NVR and cameras, you may notice that some of the camera images may not display in Live View. This most often occurs when you are displaying images in 1+5 mode, or 1+7 mode because the total bit rate for all cameras is exceeding the NVR's capacity. The actual capacity depends on the total bit rate from all the cameras. However, it is good practice to allow some headroom for machine operations, such as remote streaming.

NVR model	Capacity
4-channel	20 Mb
8-channel	40 Mb
16-channel	80 Mb
32-channel	160 Mb
64-channel	160 Mb

To fully understand NVR capacity, it is necessary to understand the concepts of streaming video, resolution, quality, and bit rate. Streaming video is content sent in compressed form over a network and processed in real time, that is, as it is received.

Streaming video types

- Main Stream: the high quality video that is being recorded and may be streamed.
- Sub Stream: never recorded; intended for streaming only. Default is 704 × 480, 584 Kbps at 8 fps.
- Can be video alone, or video and audio compressed together. Audio requires very little bandwidth.

The combination of the main stream and sub streams make up the total bit rate of each camera. This is expressed in Kbps (kilobits per second) or Mbps (megabits per second).

Bit rate is determined by the selected resolution (1280 × 720, 1920 × 1080, 2560 × 1920, etc.), frame rate (frames per second), and video quality (the amount of compression being applied to each camera).

Example

32 channels of 720P cameras at 15 fps with good image quality will have $32 \times (1536 + 512) = 65536$ Kbps (about 66Mbps), so the 32-channel NVR can support them.

Each channel can support a different camera, as long as they do not exceed the total bit rate limit. It is entirely possible to mix 5 MP cameras with 4CIF IP cameras, etc. Generally, 5 MP at 30 fps requires around 20 Mbps for best quality. A 4-channel NVR is currently limited to 16 Mbps.

Adjusting settings

Be aware of your NVR's capacity and make adjustments, if necessary. Adjust the bit rate by lowering the resolution, frame rate, or video quality setting.

To adjust the setting:

1. Enter the Live View settings interface.
2. Adjust the Resolution, Frame Rate, and Video Quality settings.

Specifications

Video/audio input	IP video input	4-ch
	Two-way audio input	1-ch, RCA (2.0 Vp-p, 1 kΩ)
Network	Incoming bandwidth	20 Mbps
	Output bandwidth	40 Mbps
	Remote connection	128
Video/audio output	Recording resolution	5 MP/ 3 MP/ 1080 p/ UXGA/ 720p/ VGA/ 4 CIF/ DCIF/ 2 CIF/ CIF/ QCIF
	HDMI/VGA output	1-ch, resolution: 1920 × 1080 P/ 60 Hz, 1600 × 1200/ 60 Hz, 1280 × 1024/ 60 Hz, 1280 × 720/ 60 Hz, 1024 × 768/ 60 Hz
	CVBS (optional)	1-ch, BNC (1.0 Vp-p, 75 Ω) Resolution: 704 × 576 (PAL); 704 × 480 (NTSC)
	Audio output	1-ch, RCA (Linear, 1 kΩ)
	Playback resolution	5 MP/ 3 MP/ 1080P/ UXGA/ 720 P/ VGA/ 4 CIF/ DCIF/2 CIF/ CIF/ QCIF
	Synchronous playback	4-ch, 720 P/ 2-ch, 1080P/ 1-ch, 5 MP
Hard disk	SATA	2 SATA interfaces for 2 HDDs
	Capacity	Up to 4 TB for each disk
External interface	Network interface	1 RJ-45 10/ 100/ 1000 Mbps self-adaptive Ethernet interface
	Serial interface	1 RS-485 half-duplex interface
	USB interface	2 × (USB 2.0)
	Alarm in/out (optional)	4/ 1
PoE	Interface	4 independent 10/ 100 Mbps PoE Ethernet interfaces
	Output Consumption	52 W
	Supported Standard	AF
Others	Power supply	100 to 240 VAC, 47 to 63 Hz, 3 A
	Consumption	≤ 15 W (without hard disk)
	Working temperature	14 to 131 °F (-10 to +55°C)
	Working humidity	10 to 90%
	Chassis	19 inch rack-mounted 1 U chassis
	Dimensions (W × D × H)	17.5 × 11.4 × 1.8 in (445 × 290 × 45 mm)
	Weight	≤ 4.4 lb. (2 Kg) (without hard disk)

Regulatory information

DISCLAIMER

Underwriters Laboratories Inc. (UL) has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested for fire, shock or casualty hazards as outlined in UL's Standard(s) for Safety, UL60950-1. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product. UL MAKES NO REPRESENTATIONS, WARRANTIES OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING RELATED FUNCTIONS OF THIS PRODUCT.

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



This product and - if applicable - the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European standards listed under the Low Voltage Directive 2006/95/EC, the EMC Directive 2004/108/EC, the RoHS Directive 2011/65/EU



2012/19/EU (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see www.recyclethis.info.



2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see www.recyclethis.info.

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